



SEQUENCE LISTING

<110> Kazuhiro MACHIDA et al.

<120> DNA PARTICIPATING IN HYDROXYLATION OF MACROLIDE COMPOUND

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<140> US 10/577,655

<141> 2006-05-01

<150> JP 2003-396828

<151> 2003-11-27

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gtcccgccagc	gtgggtccct	ttgtgcccc	ggaactctcg	tacagctcg	cctgctcg	240							
cacccactgc	gtcgggctgg	gctcgtaactc	gccctcaagt	ggcaaggat	ccgtctcc	300							
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cgccgcgtgc	gagcaccagc	gccacgaat	agaccaccgt	atgggattt	agcagggt	660							
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ccgtcacgg	cgtcgccg	tggttcc	ggggacgg	ggctgtgt	cgccccc	1080							
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c atg acg	gaa	ctg acg	gac atc	acc ggc	ggg acc	1366							
Met	Thr	Glu	L	Asp	Ile	Thr	Gly	Pro	Gly	Thr	Pro	Ala	Glu

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5

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Pro Val Ala Phe Pro Gln Asp Arg Thr Cys Pro Tyr His Pro Pro Thr

1414

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Gly Tyr Gly Pro Leu Arg Asp Gly Arg Ser Leu Ser Arg Val Thr Leu				
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ttc gac ggc cgc gag gtc tgg atg gtc acg ggc cac gcc acc gcc cgc				1510
Phe Asp Gly Arg Glu Val Trp Met Val Thr Gly His Ala Thr Ala Arg				
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gcg ctg ctc gcg gac ccc cgg ctg tcc acc gac cgc acc ctc ccc ggc				1558
Ala Leu Leu Ala Asp Pro Arg Leu Ser Thr Asp Arg Thr Leu Pro Gly				
65	70	75		
ttc ccc gtg ccc acg gcc cgc ttc gcg gcc gtc cgc gac cgg cgg gtg				1606
Phe Pro Val Pro Thr Ala Arg Phe Ala Ala Val Arg Asp Arg Arg Val				
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gcg ctg ctc ggc gtg gac gac ccc gtc cac cag acc cag cgg cgg atg				1654
Ala Leu Leu Gly Val Asp Asp Pro Val His Gln Thr Gln Arg Arg Met				
100	105	110		
atg atc ccg tcg ttc acc ctc aag cgc gcg gcc ggg ctg cgg ccc acc				1702
Met Ile Pro Ser Phe Thr Leu Lys Arg Ala Ala Gly Leu Arg Pro Thr				
115	120	125		
atc cag cgg acc gtc gac ggg ctg ctg gac gcg atg atc gag aag ggg				1750
Ile Gln Arg Thr Val Asp Gly Leu Leu Asp Ala Met Ile Glu Lys Gly				
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Pro Pro Ala Glu Leu Val Ser Ala Phe Ala Leu Pro Val Pro Ser Val				
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Val Ile Cys Gly Leu Leu Gly Val Pro Tyr Ala Asp His Glu Phe Phe				
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Glu Glu Gln Ser Arg Thr Leu Leu Arg Gly Pro Thr Ala Ala Asp Ser				
180	185	190		
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Gln Gly Ala Arg Glu Arg Leu Glu Glu Tyr Leu Gly Gly Leu Ile Asp				
195	200	205		
gac aag gag cgg cag gcc gaa ccc ggc gac ggc gtc ctg gac gac ctc				1990
Asp Lys Glu Arg Gln Ala Glu Pro Gly Asp Gly Val Leu Asp Asp Leu				
210	215	220		
gtc cac cag cgg ctg cgc acc ggc gag ctg gac cgg cgc gac gtg gtg				2038
Val His Gln Arg Leu Arg Thr Gly Glu Leu Asp Arg Arg Asp Val Val				
225	230	235		
gcg ctg gcc gtc atc ctg ctc gtg gcc ggg cac gag acg acc gcc aac				2086
Ala Leu Ala Val Ile Leu Leu Val Ala Gly His Glu Thr Thr Ala Asn				
240	245	250	255	
atg atc tcc ctc ggc acc tac acg ctg ctg cgg cac ccc ggc cgg ctg				2134
Met Ile Ser Leu Gly Thr Tyr Thr Leu Leu Arg His Pro Gly Arg Leu				
260	265	270		
gcc gag ctg cgc gcc gac cgg gcg ctg ctg ccc gcc gtc gag gag				2182
Ala Glu Leu Arg Ala Asp Pro Ala Leu Leu Pro Ala Ala Val Glu Glu				
275	280	285		
ctg atg cgg atg ctc tcg atc gcg gac ggg ctg ctg cgc ctg gcc ctg				2230
Leu Met Arg Met Leu Ser Ile Ala Asp Gly Leu Leu Arg Leu Ala Leu				
290	295	300		
gag gac atc gag atc gcc ggc gac acg atc cgg gcc ggc gag ggc gtc				2278
Glu Asp Ile Glu Ile Ala Gly Ala Thr Ile Arg Ala Gly Glu Gly Val				
305	310	315		
ctg ttc tcc acc tcg ctg atc aac cgc gac gag tcc gtg ttc gac gac				2326
Leu Phe Ser Thr Ser Leu Ile Asn Arg Asp Glu Ser Val Phe Asp Asp				

320	325	330	335	
ccc gac acc ctg gac ttc cac cgc tcc acc cgc cac cac	gtg gcc ttc			2374
Pro Asp Thr Leu Asp Phe His Arg Ser	Thr Arg His His	Val Ala Phe		
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Gly Phe Gly Ile His Gln Cys Leu Gly Gln Asn	Leu Ala Arg Ala Glu			
355	360	365		
ctg gag atc gcc ctg gyc acg ctc ctg gag cgg ctc	ccc ggc ctc cgg			2470
Leu Glu Ile Ala Leu Gly Thr Leu Leu Glu Arg	Leu Pro Gly Leu Arg			
370	375	380		
ctg gcc gcg ccc gcc gag gag atc ccg ttc aaa	ccc ggc gac acg atc			2518
Leu Ala Ala Pro Ala Glu Ile Pro Phe Lys	Pro Gly Asp Thr Ile			
385	390	395		
cag ggg atg ctg gaa ctc ccc gtg acc tgg taa	gaggctctgg tc atg cac			2569
Gln Gly Met Leu Glu Leu Pro Val Thr Trp		Met His		
400	405	410		
atc gac atc gac aag gac cgc tgc atc ggc gcc ggc	cag tgc gcg ctg			2617
Ile Asp Ile Asp Lys Asp Arg Cys	Ile Gly Ala Gly Gln Cys Ala Leu			
415	420	425		
gcc gcc ccg ggc gtg ttc acc cag gac gac gac	ggc tac agc acc ctg			2665
Ala Ala Pro Gly Val Phe Thr Gln Asp Asp Asp	Gly Tyr Ser Thr Leu			
430	435	440		
ctc ccc ggc cgc gag gac ggc ggg ggc gac ccg	atg gtc cgg gag gcg			2713
Leu Pro Gly Arg Glu Asp Gly Gly Asp Pro	Met Val Arg Glu Ala			
445	450	455		
gcc cgc gcc tgc ccg gtg agc gcc atc cgg	gtg acc gaa ccg gcc ggc			2761
Ala Arg Ala Cys Pro Val Ser Ala Ile Arg Val	Thr Glu Pro Ala Gly			
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gtggcgatcc gaccccggt	accagcggtt	tgacgcgcgt	ggcgtcgcc	3720
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gtacaccgcc	tacctcgccc	acaccagct	cggacatgcc	gtccgacaga	gcctgcccgc	180
cgaggcggca	cacgaccgct	atctggatgg	cgtgatcgac	accctcgtac	ggccgcccgg	240
cggaggcgat	gaagccgaac	atgtcacaat	ctgaacgagg	ttggcggAAC	tgcgcgcaga	300
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cgttgccatc	tcacacacga	gcaactcgag	ccacttgaga	ctcgtaacgg	aggaaattc	419
gtg acc gaa	gcc atc ccc	tac ttt cag	aac cgc acc	tgt ccc tac	cac	467
Val Thr Glu	Ala Ile Pro	Tyr Phe Gln	Asn Arg Thr	Cys Pro Tyr	His	
1	5	10	15			
ccg ccc gcc	gcc tat cag	cca ctg cgc	ggg gcc ggc	ccg ctg agc	cat	515
Pro Pro Ala	Ala Tyr Gln	Pro Leu Arg	Gly Ala Gly	Pro Leu Ser	His	
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gtc acg ttc	tac gac ggc	cggtt aag	gtg tgg gcg	gtc acc ggc	cac ccc	563
Val Thr Phe	Tyr Asp Gly	Arg Lys Val	Trp Ala Val	Thr Gly His	Pro	
35	40	45				
gag gca	cgg gcg	ctg ctg acc	gac cag cga	ctc tcc gcc	gac cgg cag	611
Glu Ala Arg	Ala Leu Leu	Thr Asp Gln	Arg Leu Ser	Ala Asp Arg	Gln	
50	55	60				
aac ccg	gcc ttc	ccg gtc ccc	ttc gaa cgc	ttc gcg gcc	atc cgc cgg	659
Asn Pro Ala	Phe Pro Val	Pro Phe Glu	Arg Phe Ala	Ala Ile Arg	Arg	
65	70	75	80			
gtc cgg acg	ccg ctg atc	ggg gtc gac	gac ccg gag	cac aac acc	cag	707
Val Arg Thr	Pro Leu Ile	Gly Val Asp	Asp Pro Glu	His Asn Thr	Gln	
85	90	95				
cgc cgg atg	ctg atc ccc	agc ttc agc	ctc aag cgg	acc gcc gca	ctg	755
Arg Arg Met	Leu Ile Pro	Ser Phe Ser	Leu Lys Arg	Thr Ala Ala	Leu	
100	105	110				
cgg ccg gag	atc cag cgg	atc gtc gac	ggg ctg ctc	gac cgg atg	ctg	803
Arg Pro Glu	Ile Gln Arg	Ile Val Asp	Gly Leu Leu	Asp Arg Met	Leu	
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gat cag	ggc ccg ccc	acc gag ctg	gtc tcc gcg	ttc gcc ctg	ccg gtc	851
Asp Gln Gly	Pro Pro Thr	Glu Leu Val	Ser Ala Phe	Ala Leu Pro	Val	
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Pro Ser Met	Val Ile Cys	Ala Leu Leu	Gly Val Ser	Tyr Ala Asp	His	
145	150	155	160			
gag ttc ttc	gag gag tcc	cgc atc ctg	cgc ggc cgg	tcg gcc	947	
Glu Phe Phe	Glu Glu Ser	Arg Arg Ile	Leu Arg Gly	Arg Ser Ala		
165	170	175				
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Glu Glu Ala	Glu Asp Ala	Arg Leu Lys	Leu Glu Glu	Tyr Phe Thr	Gly	
180	185	190				
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Leu Ile Ala	Ala Lys Glu	Lys Asn Pro	Gly Asp Gly	Leu Leu Asp	Glu	
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Val	Arg	Leu	Ala	Met	Ile	Leu	Leu	Val	Ala	Gly	His	Glu	Thr	Thr	Ala	
225					230				235						240	
aac	atg	atc	tcg	ctc	ggc	acc	tcc	acc	ctg	ctg	gac	cac	ccc	gag	cag	1187
Asn	Met	Ile	Ser	Leu	Gly	Thr	Phe	Thr	Leu	Leu	Asp	His	Pro	Glu	Gln	
					245				250					255		
ctg	gcg	cag	ctc	aag	gcc	gac	gag	ggc	ctg	atg	ccg	gcc	gcc	atc	gag	1235
Leu	Ala	Gln	Leu	Lys	Ala	Asp	Glu	Gly	Leu	Met	Pro	Ala	Ala	Ile	Glu	
					260				265					270		
gag	ctg	ctg	cga	ttc	ctg	tcc	atc	gcg	gac	ggc	ctg	ctg	cg	gtg	g	1283
Glu	Leu	Leu	Arg	Phe	Leu	Ser	Ile	Ala	Asp	Gly	Leu	Leu	Arg	Val	Ala	
					275				280					285		
acg	gag	gac	atc	gag	atc	ggc	ggt	cag	gtg	atc	cg	gcc	gac	gac	g	1331
Thr	Glu	Asp	Ile	Glu	Ile	Gly	Gly	Gln	Val	Ile	Arg	Ala	Asp	Asp	Ala	
					290				295					300		
gtc	ctg	ttc	ccc	gcc	tca	ctg	atc	aac	cg	gac	gg	cc	gcc	tat	ccg	1379
Val	Leu	Phe	Pro	Ala	Ser	Leu	Ile	Asn	Arg	Asp	Glu	Ala	Ala	Tyr	Pro	
					305				310					315		
gca	ccc	gac	gag	ctg	gac	ctc	ggc	cgt	tcg	gcc	cgc	cat	cac	gtg	g	1427
Ala	Pro	Asp	Glu	Leu	Asp	Leu	Gly	Arg	Ser	Ala	Arg	His	His	Val	Ala	
					325				330					335		
tcc	ggc	ttc	ggg	atc	cac	cag	tgc	ctg	ggg	cag	aa	ctc	gcc	cg	gc	1475
Ser	Gly	Phe	Gly	Ile	His	Gln	Cys	Leu	Gly	Gln	Asn	Leu	Ala	Arg	Ala	
					340				345					350		
gag	atg	gag	atc	g	ctg	cgc	tca	ctg	ttc	acc	agg	atc	ccg	cag	ctg	1523
Glu	Met	Glu	Ile	Ala	Leu	Arg	Ser	Leu	Phe	Thr	Arg	Ile	Pro	Gln	Leu	
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cgg	ctc	gcc	gtg	ccg	ggc	gac	att	ccg	ttc	aag	gac	gga	gac	acc		1571
Arg	Leu	Ala	Val	Pro	Ala	Ala	Glu	Ile	Pro	Phe	Lys	Asp	Gly	Asp	Thr	
					370				375					380		
ctg	caa	ggc	atg	atc	gaa	ctg	ccg	ctg	gcc	tgg	tag	cagccaggac	ggcaga			1623
Leu	Gln	Gly	Met	Ile	Glu	Leu	Pro	Leu	Ala	Trp						
					385				390					395		
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Met	Arg	Ile	Ala	Ile	Asp	Thr	Asp	Arg	Cys	Ile						
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ggc	gc	cag	tgt	gc	ct	cc	gg	gg	ttc	acc	cag	gat				1723
Gly	'Ala	Gly	Gln	Cys	Ala	Leu	Thr	Ala	Pro	Gly	Gly	Phe	Thr	Gln	Asp	
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gac	gac	ggt	ttc	agt	gca	ctg	ctg	ccc	ggc	cg	gag	gac	ggc	ggc		1771
Asp	Asp	Gly	Phe	Ser	Ala	Leu	Pro	Gly	Arg	Glu	Asp	Gly	Ala	Gly		
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gac	ccg	ctg	gtg	cg	gaa	gc	cc	cg	gc	tgc	ccc	gt	cag	gc	att	1819
Asp	Pro	Leu	Val	Arg	Glu	Ala	Ala	Arg	Ala	Cys	Pro	Val	Gln	Ala	Ile	
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gcg	gtc	acc	gac	gat	tag	cagcacc	ccc	ggc	ggc	cc	acat	ccgg	cac	cc	ggcc	1875
Ala	Val	Thr	Asp	Asp												
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ggcatccacc	ccatccgcta	ccgcaacacc	ccttgggtga	ccggcagttt	cgaggacccc											1995
ggtgtgccc	gggcgtactg	gtgaccgtca	ccggcttac	gccgcattt	cccacatagg											2055
cgtcgtcgct	cgccggcgatc	acgaagcg	gtcggtgccc	ccgctcgtaa	cggtgcacga											2115
tgcccgcc	ttccacgggt	aaccgcggg	ccacatccgg	cacccggcc	ggggccacca											2175
acaggtgcac	cagcgtttc	ctgcccgtcg	gcccgcacatc	gtagagcttgc	gcgaacagca											2235
ccagttgtc	cggccatcc	gcccgcacatc	gcccgcacatc	gtagagcttgc	gcgaacacac											2295
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 <213> Unknown

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 <223> Description of Unknown Sequence: nucleotide sequence with coding region derived from an unknown source

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 gggcatctaa tgaagatcgg caccgacgcat ctttcgtctg cgaggtctcc c atg aca 177
 Met Thr
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gac acg aca gac ctg acc gag ctg tca gat ccc gtc tcc ttc ccc cag 225
 Asp Thr Thr Asp Leu Thr Glu Leu Ser Asp Pro Val Ser Phe Pro Gln
 5 10 15

gac cgg agc tgc ccc tac cac ccg ccc acc ggg tac gac ccg ctg cgc 273
 Asp Arg Ser Cys Pro Tyr His Pro Pro Thr Gly Tyr Asp Pro Leu Arg
 20 25 30

acc gaa cgg ccg ccc gcc cgc atc ccg ctc tac gac ggc cgc ccc gcc 321
 Thr Glu Arg Pro Pro Ala Arg Ile Arg Leu Tyr Asp Gly Arg Pro Ala
 35 40 45 50

tgg ctc gtc acc ggc cac gcc gtc gcc cgt gac ctg ctg gtc gac ccc 369
 Trp Leu Val Thr Gly His Ala Val Ala Arg Asp Leu Leu Val Asp Pro
 55 60 65

cgc ctg tcc acg gac cgc acc cgc tcg ggc ttc ccg gcc aca act ccc 417
 Arg Leu Ser Thr Asp Arg Thr Arg Ser Gly Phe Pro Ala Thr Thr Pro
 70 75 80

cgc ttc gcc gcg gtc cgc gac cgc aag ccg gcg ctc ctc ggc gtc gac 465
 Arg Phe Ala Ala Val Arg Asp Arg Lys Pro Ala Leu Leu Gly Val Asp
 85 90 95

gac ccc aag cac cgc acc cag ccg tgg atg atg atc ccg agc ttc acc 513
 Asp Pro Lys His Arg Thr Gln Arg Trp Met Met Ile Pro Ser Phe Thr
 100 105 110

ctc agg cgc gcc acc gag ctc agg ccg cgc atc cag gag atc gtc gac 561
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115	120	125	130	
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135	140		145	
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150	155		160	
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165	170		175	
ctg ctg cgc gga ccg gcg gcc gag gac acg cag gac gcc cgg gac cgg Leu Leu Arg Gly Pro Ala Ala Glu Asp Thr Gln Asp Ala Arg Asp Arg				753
180	185		190	
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195	200		205	210
ggt gac ggc ctg ctg gac gaa ctc gtc cag cag cgt ctg aac gaa ggc Gly Asp Gly Leu Leu Asp Glu Leu Val Gln Gln Arg Leu Asn Glu Gly				849
215	220		225	
gag ctc gac cgg gag gaa ctg acc gcg ctg gcg atg atc ctg ctg gtc Glu Leu Asp Arg Glu Glu Leu Thr Ala Leu Ala Met Ile Leu Leu Val				897
230	235		240	
gcg ggc cac gag acc acc gcc aac atg atc tcc ctg ggc acc tac acg Ala Gly His Glu Thr Thr Ala Asn Met Ile Ser Leu Gly Thr Tyr Thr				945
245	250		255	
ctc ctg ctg cac ccc gaa cgg ctg acc gag ctg cgc gcc gac ccc gcg Leu Leu Leu His Pro Glu Arg Leu Thr Glu Leu Arg Ala Asp Pro Ala				993
260	265		270	
ctg ctg ccg gcc gtc gag gaa ctg atg cgg atg ctg tcc atc gcg Leu Leu Pro Ala Ala Val Glu Glu Leu Met Arg Met Leu Ser Ile Ala				1041
275	280		285	290
gac gga ctg ctg cgg cag gcc acc gag gac atc gag atc gcc ggg acc Asp Gly Leu Leu Arg Gln Ala Thr Glu Asp Ile Glu Ile Ala Gly Thr				1089
295	300		305	
acc atc agg gcc ggg gac ggc gtg gtc ttc tcc acc tct gtc atc aac Thr Ile Arg Ala Gly Asp Gly Val Val Phe Ser Thr Ser Val Ile Asn				1137
310	315		320	
cgc gac gag gac gtc tac ccg gcc ccc gac acc ctc gac ttc cac cgc Arg Asp Glu Asp Val Tyr Pro Ala Pro Asp Thr Leu Asp Phe His Arg				1185
325	330		335	
tcg acc cgc cac cac gtc gcc ttc ggt ttc gga atc cac cag tgc ctc Ser Thr Arg His His Val Ala Phe Gly Phe Gly Ile His Gln Cys Leu				1233
340	345		350	

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Gly Gln Asn Leu Ala Arg Thr Glu Leu Glu Ile Ala Leu Arg Thr Leu	
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Leu Glu Arg Leu Pro Thr Leu Arg Leu Ala Ala Pro Pro Glu Glu Ile	
375 380 385	
ccc ttc aaa ccc ggc gac acc atc cag ggg atg ctg gaa ctc ccc gtc	1377
Pro Phe Lys Pro Gly Asp Thr Ile Gln Gly Met Leu Glu Leu Pro Val	
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Ser Trp Met His Ile Glu Ile Asp Lys Asp Arg Cys	
405 410	
atc ggc gcc gga cag tgc gcc ctg acc gcc ccg ggt gtg ttc acc cag	1476
Ile Gly Ala Gly Gln Cys Ala Leu Thr Ala Pro Gly Val Phe Thr Gln	
415 420 425 430	
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Asp Asp Asp Gly Phe Ser Asp Leu Leu Pro Gly Arg Glu Asp Gly Ala	
435 440 445	
ggc gac ccg atg gtc cgg gag gcc gcc agg gcc tgc ccc gtg agt gcc	1572
Gly Asp Pro Met Val Arg Glu Ala Ala Arg Ala Cys Pro Val Ser Ala	
450 455 460	
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Ile Thr Leu Ser Glu Asp Gly	
465	
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